

WHAT IS CLAIMED IS:

- 1 1. A method for determining whether a MEMS device is in a select state
2 defined by a position of a moveable element comprised by the MEMS device, the method
3 comprising:
4 changing a voltage of a first region of a sensing configuration; and
5 measuring a second region of the sensing configuration,
6 wherein the first and second electrically active regions are electrically coupled
7 when the MEMS device is in the select state and electrically uncoupled when the MEMS
8 device is not in the select state.
- 1 2. The method recited in claim 1 wherein the sensing configuration
2 comprises a transistor.
- 1 3. The method recited in claim 2 wherein the sensing configuration
2 comprises a field-effect transistor having a source region corresponding to the first region and
3 a drain region corresponding to the second region.
- 1 4. The method recited in claim 2 wherein the sensing configuration
2 comprises a bipolar junction transistor having an emitter region corresponding to the first
3 region and a collector region corresponding to the second region.
- 1 5. The method recited in claim 1 wherein:
2 the first and second regions comprise first and second waveguide ports; and
3 measuring the second region comprises measuring an impedance between the
4 first and second waveguide ports.
- 1 6. The method recited in claim 1 wherein the moveable element is not in
2 contact with the first or second regions when in the position defining the select state.
- 1 7. The method recited in claim 1 wherein the moveable element is in
2 contact with the first and second regions when in the position defining the select state.
- 1 8. The method recited in claim 7 wherein the first and second regions
2 comprise electrically conductive regions.

1 9. The method recited in claim 1 further comprising performing changing
2 the voltage and measuring the second region periodically.

1 10. The method recited in claim 9 further comprising periodically restoring
2 a voltage to an electrode configured to provide an electrostatic force on the moveable
3 element.

1 11. The method recited in claim 1 wherein changing the voltage of the first
2 region comprises applying an ac voltage spike to the first region.

1 12. A MEMS device comprising:
2 a moveable element configured to move to a position defining a select state of
3 the MEMS device upon activation of an electrode;
4 a sensing configuration having first and second regions, wherein the first and
5 second regions are electrically coupled when the moveable element is in the position and
6 electrically uncoupled when the moveable element is not in the position; and
7 a detector configured to indicate when the first and second regions of the
8 sensing configuration are electrically coupled.

1 13. The MEMS device recited in claim 12 wherein the sensing
2 configuration comprises a transistor.

1 14. The MEMS device recited in claim 13 wherein:
2 the sensing configuration comprises a field-effect transistor;
3 the first region comprises a source of the field-effect transistor; and
4 the second region comprises a drain of the field-effect transistor.

1 15. The MEMS device recited in claim 13 wherein:
2 the sensing configuration comprises a bipolar junction transistor;
3 the first region comprises an emitter of the bipolar junction transistor; and
4 the second region comprises a collector of the bipolar junction transistor.

1 16. The method recited in claim 12 wherein the first and second regions
2 comprise first and second waveguide ports.

1 17. The method recited in claim 12 wherein the moveable element is in
2 contact with the first and second regions when in the position.

1 18. The MEMS device recited in claim 12 further comprising a dynamic
2 refresh driver electrically coupled with the first region and configured to periodically provide
3 an ac signal to the first region.

1 19. A microstructure for steering light, the microstructure comprising:
2 a substrate;
3 a structural linkage connected with the substrate and supporting a moveable
4 element disposed to orient a reflective coating;
5 an electrode disposed to provide an electrostatic force on the moveable
6 element upon actuation; and
7 a sensing configuration having first and second regions that are electrically
8 coupled only when the moveable element is in a position that defines a select state for the
9 microstructure.

1 20. The microstructure recited in claim 19 wherein the sensing
2 configuration comprises a transistor formed within the substrate.

1 21. The microstructure recited in claim 20 wherein:
2 the sensing configuration comprises a field-effect transistor;
3 the first region comprises a source of the field-effect transistor; and
4 the second region comprises a drain of the field-effect transistor.

1 22. The microstructure recited in claim 20 wherein:
2 the sensing configuration comprises a bipolar junction transistor;
3 the first region comprises an emitter of the bipolar junction transistor; and
4 the second region comprises a collector of the bipolar junction transistor.

1 23. The microstructure recited in claim 19 wherein the first and second
2 regions comprise first and second waveguide ports.

1 24. The microstructure recited in claim 19 wherein the moveable element
2 is in contact with the first and second regions when in the position.

25. The microstructure recited in claim 19 wherein the microstructure is one of a plurality of similar microstructures comprised by an array.

26. The microstructure recited in claim 25 wherein:
the first region of each of the microstructures is electrically coupled with a dynamic refresh driver;
the electrode of each of the microstructures is electrically coupled with the dynamic refresh driver; and
the second regions of the microstructures are electrically coupled with one another.

27. The microstructure recited in claim 26 wherein the array is comprised by a wavelength router.

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